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Cloud Enabled Business Model Innovation: Gaining Strategic Competitive Advantage as the Market Emerges

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Abstract

Previous studies present an extensive coverage of cloud computing as a disruptive technology. Building from these studies, the aim of this research was to gain more understanding of the innovation of the business model of customers as a result of adopting cloud service delivery models. Our findings suggest that the market of cloud service delivery models is in an emerging stage. Customers are selective as they focus on the fit between cloud service delivery models and the nature of activities within their organizations. Our findings also suggest that the adoption of cloud delivery models lead to the innovation of the business model of customers. However due to the fact that the market structure is in an emerging stage and the maturity of cloud technology is evolving, a co-evolution of the variables of the business model is expected to lead to the refinement of the business model innovation over time.

Keywords: Cloud service delivery models; emerging market; business model innovation; technology innovation; strategic competitive advantage.

Introduction

According to various market research studies cloud computing is a technology trend that is expected to transform the traditional way of purchasing and delivering ICT services (Berman et al 2012; Forrester, 2012; Gartner Inc. 2012). It is also suggested that cloud computing is a game changer with respect to the current ICT outsourcing model. In the essence, it is recognized in the industry that cloud computing has the potential to fundamentally change the competitive landscapes by providing a new platform for driving innovation and business value. While there is a growing attention to the potential of cloud computing as a promising technology innovation, there is also a need to understand how cloud services can be deployed to create business value for firms that are used to operate large and complex ERP (Enterprise Resource Planning) systems as well as other Internet based business software to support their business operations. This provides the motivation for this study that is aimed at investigating the business model innovation side of cloud computing. Previous research has focused for example on the transformative impact of business models and the role of the business model in capturing value from innovation (Chesbrough, 2006; Johnson Christensen and Kagermann, 2008). But there is very few literature available today on how cloud computing enables business model innovation in multi-sourcing arrangement between a firm and its suppliers. To fill this literature gap this study has investigated the impact of cloud computing on key business model variables.

The paper is organized as follows. The second section presents a review of the literature on the maturity and competitive impact of cloud technology. The third section reviews the literature on business model innovation. The fourth section presents the research framework. The fifth section presents the methodology and the sixth section discusses the findings. Finally, our conclusion is presented in the seventh section.

The maturity and competitive impact of cloud technology: An evolution towards the state of key technology

The concept of technology maturity places a technology along a continuum of technology advance and helps to formulate the technology strategy within organizations. Frameworks for analysing the maturity of technologies generally discuss a technology evolution from the embryonic phase, through the growth phase to the mature and aging phases (Foster, 1986; Roussel, 1991; Chiesa, 2001). In the essence it is a strategic planning concepts aimed at supporting the assessment of the level of advance of technologies. In the embryonic stage a possible application of the technology exists, but the nature of solutions and the route to future development to industrial production remains uncertain. In the growth stage knowledge has been accumulated and technology advances is still in progress but much uncertainty has been erased. The mature stage is associated with the increased diffusion of the technology as it is perceived as proven technology and well understood by organization across industries. The yearly publication of the hype cycle of technologies by Gartner Inc. is a practical example of the assessment of the perceived evolution of the maturity level of technologies in the industry. Technologies are assessed based on the level of scientific and engineering advances as well as the usability in terms of the practical applications. According to Gartner Inc. (2012), cloud technologies have move beyond the peak of inflated expectations and is now entering the stage of trough disillusionment whereby a realistic insight into the capabilities is sharpening based increased experimentation or implementation of cloud technology solutions. The next step in the evolution of cloud technologies in the hype cycle is the stage of slope of enlightenment. This stage is similar to the growth stage of cloud technologies. This means that cloud technologies would have reached the maturity level of proven technologies that in turn will pave the way for the growth of its adoption. While the maturity level provides an indication of the scientific and engineering advances as well as possible business applications, the understanding of the competitive impact of technologies is determinant for the adoption in the marketplace.

From a strategic planning prospective, the competitive impact of technologies represents a progression over time from the stage of pacing technology to key technology and to base technology (A.D. Little, 1980; Pappas, 1984; Roussel et al, 1991; Floyd, 1997). Pacing technologies have the potential to change the entire basis of competition but have not yet been embodied in products or processes. Key technologies are most critical to competitive success because they offer the opportunity for meaningful process or product differentiation. Although base technologies are perceived as necessary and essential to guarantee business continuity on the short term, they offer little competitive advantage. Traditionally, the competitive impact of technologies is associated with differentiations in product and service and not with differentiations in the business model. This view is based on an old school of thought on innovation and competitive advantage whereby technology innovation leads to product innovation or process innovation only. However, in recent years, more attention has been paid in the research community to the concept of business model innovation as a complementary element in the process of value creation from technology innovation (Chesbrough 2006; Prahalad and Krishnan, 2008; Johnson, Christensen and Kagermann, 2008).

Roussel et al (1991) suggest that technology maturity is intrinsic to the technology regardless of the industry in which it is applied, while the competitive impact of technology is extrinsic as the impact closely depends on the industry that applies it. This means that cloud technologies may be strongly perceived in an industry as a key technology with high competitive impact and may not be perceived as such in another industry. Moreover, the competitive impact of a technology is linked to changes in the business model that helps creating value.

Gaining strategic competitive advantage as the market emerges: A business model innovation perspective

In the recent years, studies on strategic competitive advantage has increasingly moved beyond the traditional focus of innovation on product, service and business process differentiation based on technology advances to address value creation from the innovation on the business model of firms (Chesbrough 2006; Prahalad and Krishnan, 2008; Johnson, Christensen and Kagermann, 2008). Building from the idea of business model canvas, Osterwalder en Pigneur (2010) suggest that business model innovation is about challenging orthodoxies to design original models that meet unsatisfied, new or hidden customer needs. In their approach they focus essentially on customer needs. According to Giesen et al (2010), firms constantly seek business model innovation to gain flexibility and cost advantage through partnership and outsourcing. Mitchell and Coles (2004) associates a strategic competitive advantage with continuing business model innovation. They argue that a firm gains a strategic competitive advantage when its products and services are provided in ways that deliver more sales, higher profitability and greater cash flow compared to competitors. In this context, they view business model innovation as a replacement of the existing business model of the firm. They argue that changes should occur in at least four elements of the business model in order to create a sustained enhancement of the performance. According to Mitchell and Coles (2004) business model innovation focuses on changing the value delivery system of the firm. Consistently with this view, Lindgart et al (2009) suggest that business model innovation is the result of the reinvention of two or more elements of the business model of the firm to deliver value in a new way. From a customer orientation, Steenkamp and van der Walt (2004) do not limit business model innovation to changes in just few elements of the business model. They state that business model innovation should encompass changes in all the elements of the business model of the firm. Chesbrough and Rosenbloom (2003) emphasize the transformation of technology innovation into economic values through business mode innovation. In the essence they focus on the idea that business model innovation is determinant in the process of creating and capturing value from technology innovation.

Johnson, Christensen and Kagermann (2008) state that firms generally create new products that disrupt competitors without fundamentally changing their own business model in existing markets. They argue that this approach has limitations when firms attempt to create new sources for growth. In this context firms not only venture into unknown market territory but also into unknown business model territory. They suggest that firms should learnt to discover when there is a need to reinvent their business model. In their view, the timing for engaging a business model innovation is driven by strategic circumstances. It is suggested that those strategic circumstances involve the opportunity capitalize on new technology or on shifting basis of the competition as existing products and services in the market are becoming commodities for example. While other studies have explained how existing market conditions drive the need for business model innovation based on transaction cost economics theories and agency theories, Holloway and Sebastiao (2010) discuss the concept of business model innovation in the context of an emerging market. From an institutional innovation viewpoint, they argue that when a market emerges, market rules and norms as well as industry structure and boundaries are not widely understood and stable like in existing markets. They state that business model innovation occurs in a co-evolution process with the emerging market, driven by entrepreneurial actions. According to Johnson, Christensen and Kagermann (2008), successful new businesses typically revise their business models four times or so on the road to profitability. This means that market rules and norms, industry boundaries and metrics are often the last element to emerge when developing a business model in an emerging market. Furthermore, previous studies on decision making in emerging markets suggest that entrepreneurs eschew transaction efficiency for strategic flexibility when developing business models (Holloway and Sebatiao, 2010). This is reflected in the findings by Sarasvathy and Dew (2005) as they note that while small and incremental resource commitment is not always the most efficient strategy, entrepreneurs prefer such approach because it enables them to refine their business model in pursuit of increasing stakeholder commitment as hypothesized market gains clarity.

Our study builds from the assumption that cloud computing is a new technology solution that has the potential to shift the basis of competition. This provides the strategic circumstance for the need of business model innovation based on cloud service delivery models. As the maturity and the competitive impact of cloud technologies is still evolving, we also assume in our study that the market of cloud service deliver models is in an emerging stage. In the next section we present our research framework for analysing how cloud technologies enables business model innovation in the context of an emerging market.

Research framework: Towards a cloud enabled business model innovation

In this section we present the framework that was developed for the purpose of our research. Table 1 presents the definition of the cloud service delivery model variable. We use the term cloud service delivery model that represents the new way of delivering information technology services to customers based on cloud computing. There are three different cloud service delivery model that can be use independently from each other.

Table 1 Definition of the cloud technology

Variable	**Definition**
Cloud Service Delivery Model	It involves Saas-Software as Service delivery model, PaaS-Platform as a Service delivery model and IaaS- Infrastructure as a Service delivery model

Table 2 Definition of the variables of business model

Variables	**Definition**
Emerging Market Segment	Customer adoption of the cloud service delivery model. It involves the drivers for changes as the market emerges.
Value Proposition	The value to be created by suppliers and to be captured by users of the cloud service delivery model e.g. innovation, time to market, agility/flexibility, cost reduction, security.
Value Chain	The way business processes of functional units are structured and linked together using cloud services delivery model. It involves how the value chain is redesigned to synergize resources in order to achieve high efficiency.
Revenue Structure	The effect of the cloud service delivery model on the revenue structure of the firm. E.g. creating new revenue sources.
Cost Structure	The effect of the cloud service delivery model on reducing operational expenditure- OPEX and capital expenditure-CAPEX of the firm in order to improve the profitability.

The literature review reveals that there are various definitions of business model variables. Table 2 presents the business model variables used in our research that are based on the definition by Chesbrough (2003), Holloway and Sebastiao (2010). We have replaced the variable market segment in the traditional definition of business models by emerging market segment as we build from the assumption that the market for cloud service model is in an emerging stage. Regarding the cost structure, we make a distinction between the impact of cloud service delivery on operational expenditure on the one hand and on capital expenditure on the other hand. Although value network is

one the variables associated with the business model of firm, we didn't consider it in this phase of our research due to limited time to collect sufficient data for the analysis. The research framework in Figure 1 presents the relationships between the variables. The framework was designed to address the following research questions:

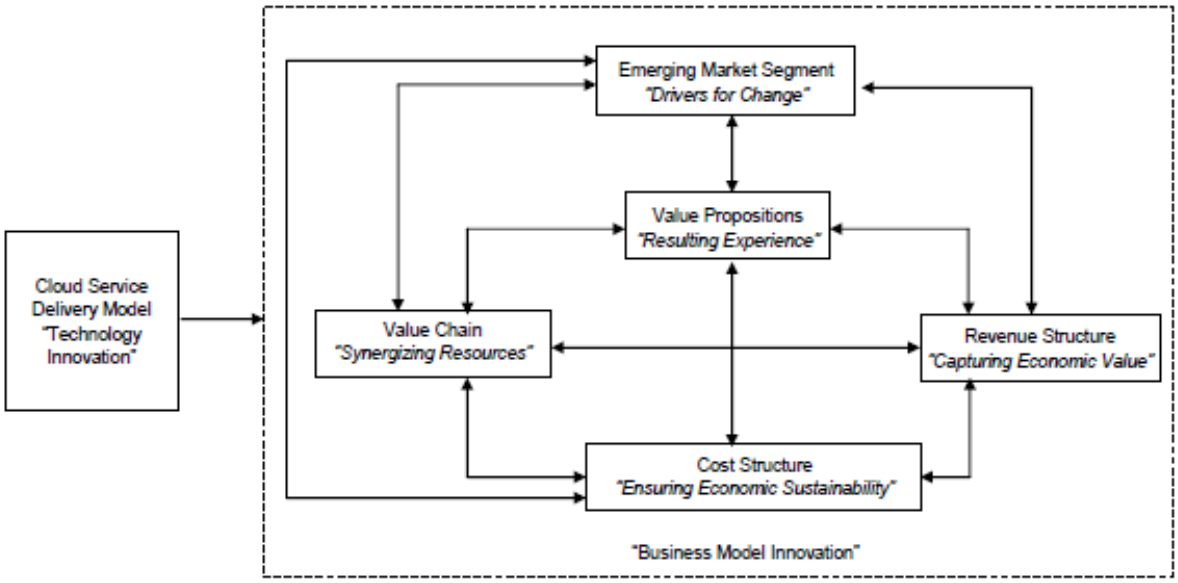

Figure 1 The impact of cloud service delivery models on business model innovation

Which cloud service delivery model is adopted by customers and why?
Our starting point in this study is not a one size fits all approach regarding the adoption of cloud service delivery models. Depending on the innovation strategy a firm is pursing, the leadership might decide to adopt either one or two or all the three cloud service models. Furthermore differences in the needs of the business units or departments may lead to the decision to adopt different cloud service delivery models. Such a decision is determinant for the outcome of the competitive impact of cloud technology as it defines the areas where the firms intends to generate a competitive advantage through business model innovation. For this reason our intend is to identify which service delivery model is adopted by customers and why.

What changes occur in the variables of existing business model of customers?
The literature reveals that one of the reason that led to the failure of firms to capitalize on technology innovation to create and capture value is the lack of the understanding the business model innovation side (Christensen, 2008). Executive may understand the potential of cloud technology to help creating and capturing value and therefore decide to invest in a business venture to deploy a cloud service delivery model. However it is another challenge to indentify the changes required in business model variables and consistently manage the executive those changes in order to implement a business model innovation. That is why we seek to address the issue of what changes occur in the business model of customers as a result of adopting a cloud service delivery model. We use the definition by Mitchel and Coles (2004) that states that business model innovation means any successful change in any element of the existing business model of the firm. Based on the findings from previous studies (Holloway and Sebastiao, 2010), our study aims at understanding the quest for an effective business model innovation via a process of experimentation and evolution as we assume that the market for cloud services is still in an emerging stage.

What is the degree of interdependency between the variables of the business model innovation?
According to the definition by Johnson, Christensen and Kagermann (2008) a business model consists of interlocking elements that, taken together, create and deliver value. They suggest that it is the interaction between the elements that lead to the effectiveness of the business model. We adopted this view in our study, although we use the business model elements by Chesbrough (2003) as presented in Figure 1. We seek to understand the degree of interaction between the variables of the business model innovation as the result of a adopting cloud service delivery model.

Methodology

Research design
The unit of analysis of this study is the customer organisation. It consists of large organisation with at least 1000 employees. Based on the nature of the research questions that address the "how" and the "what" we decided to conduct a case study. While business model innovation is subject that has gained substantial attention in the research community in recent years, there is not yet a widely shared understanding of its application in the practitioner community. This is a additional motivation for selecting a case study approach that allows for in-depth exploration of the phenomenon under investigation. The case study involves a large manufacturer in de semiconductor industry in The Netherlands. Semi-structured interviews were conducted with 6 senior managers responsible for technology and innovation strategies, R&D, manufacturing, customer relationship management system and project management.

In addition to the case study, a survey was conducted among 12 large organisations in the Netherlands in different sectors including banking, insurance, oil & gas, telecom, government, dredging and earthmoving, maritime infrastructure and terminal. A total of 20 senior managers from organisations in these sectors participated in the survey. A questionnaire was designed using a five-point scale for answering the questions. The combination of the case study and the survey allows us to effectively address the research questions by collecting relevant data to assess the understanding business model innovation from a practitioner viewpoint and to measure the interaction between the variables of the research framework.

Data analysis
We use a combined qualitative and quantitative analysis methods. Regarding the qualitative analysis, the outcome of the interviews were transcribed and structured according to the variables of the research framework. The result of interviews were content analysed to establish and summarise the findings with respect to the research questions. The quantitative analysis of the survey data was conducted using a standard statistical method. The Spearman's Rho correlation method was used to analyse the interaction between the variables. Because we assume that business model innovation does not necessarily follow a normal distribution, a non-parametric statistical method is more likely to be appropriate in order to measure the interaction between the variables. The result of the correlations is presented in Table-3.

Findings and discussion

In this section we discuss the findings based on the research questions, the results of the statistical analysis and the content analysis of the outcome of the interviews.

The cloud Service delivery models adopted by customers and why

We found that customers use Infrastructure as a service to support supply chain management activities. The interviews reveal that the supply chain activity within the firm is very complex as it involves a lot of data to be processed. To indicate the magnitude of the complexity, it was mentioned that the data records could be as high as 1 million per processing engines. The firm use a linear programming tool to transfer and process the data in the cloud solution (infrastructure as service). The linear programming tool is also integrated with the internal enterprise resource planning system of the customer. This helps to transfer the result to the internal resource planning system when the

processing of the data in cloud is completed. Another cloud service delivery model that is used is software as a service. It is used to support customer relationship management and human resource management activities with a so called lightweight software solution. It appeared that the use of cloud service delivery models differs between the departments. Marketing & sales and human resource departments tend to use more software as a service and infrastructure as a service while R&D and manufacturing tend to use infrastructure as service. However R&D and manufacturing are more cautious in their use of cloud service delivery models as they avoid the risk to unintentionally disclose the intellectual property or production information of the firm. Marketing & sales but also human resource appears to be front runners in the adoption of cloud service delivery models. According customers, cloud delivery models are not one size fits all solution. Customization is needed, taking into the strategic and operational challenges of the different functional units within the firm.

Changes that occur in the existing business model of customers

Emerging market - During the last decades, organizations in the public sector and in the private sector have adopted the outsourcing of part of their supporting activities such as ICT and human resource as a strategy to improve their operational efficiency and their competitiveness. The interviews reveals that the adoption of cloud service delivery models is perceived as the next frontier in the pursued strategy to source supporting activities as a service from external suppliers. It appears that cloud delivery models are changing the granularity of the ICT market structure. Traditionally, customers purchase large and complex enterprise resource planning systems from software vendors. Those systems that in some cases are perceived as monolithic with little flexibility, generally take years to be fully implemented by vendors and service providers. Customers indicate that in the end they may use just part of the functionalities of the complex enterprise resource planning system. We found that traditional software vendors and ICT service providers are rethinking their positioning in the market as small and innovative software companies are increasingly using cloud technologies to deliver lightweight software as service to customers. This suggests that boundaries between customers, vendors and service providers in the existing ICT market are shifting. Another issue is the limitation of the current regulation that prohibit organizations in the public sector as well as in the banking sector and the healthcare sector to host their data or directly access data from software systems in foreign countries or certain regions of the world. Vendors try to mitigate this limitation by providing private could solutions to those organizations that face restrictions from government regulations. Public cloud solutions are provided to organizations that do not face restrictions regarding the storage and access of their data in foreign countries. In this context we found that customers are increasingly experimenting with the implementation of cloud service delivery models in an attempt to learn. From an institutional viewpoint, the observed phenomenon of shifting boundaries in the existing ICT market and the uncertainty about future government relations regarding data storage and access for certain sectors suggest that a new ICT market is emerging. It is driven by technology innovation based on cloud technologies and growing customer demand for faster, efficient and lower cost of ICT services.

Value proposition – In addition to cost reduction, customers generally mention agility and scalability as the value proposition associated with cloud service delivery models. Agility and scalability refers to the ability to scale up and scale down the use of processing power of servers or accessing a dedicated software module any time and on demand without a long provisioning time and effort. This is perceived as a significant advantage compared to the traditional ICT service delivery models whereby it can take weeks and months to deploy and provision a software solution. Customers suggest that time-to-market is strongly associated with the s the value proposition of cloud service delivery models. But it appears that innovation is moderately associated with the value proposition of cloud service delivery models This may suggest that customers do yet understand how they can leverage cloud service delivery model to innovate their businesses.

Value chain - The interviews reveal that there is a confusion about the role and responsibility of the internal ICT organization as business units tend to bypass the traditional demand –supply relationship between ICT and the business. It appears in one case that the human resource department implemented

a cloud solution, software as a service, to measure employee performance without the consent of the ICT department. Traditionally the ICT department is an influent stakeholder in the decision making regarding the deployment of software solutions. But the position of the ICT department in the value chain is changing. The adoption of cloud delivery models leads to the need to redesign the value chain that involves business units, ICT department and suppliers of cloud solutions. It is suggested that there is a need for a common vision among the stakeholders about how to redesign the value and establish a governance model that will enable a successful deployment of cloud service delivery models through collaboration. Without the fulfillment of such a precondition, there is a risk of a proliferation of cloud solutions that could erode the cost advantage over time. It is suggested that there is also a need to define new roles, competences and skills for employees, taking into account the necessity for more senior employees capable to deals with complex business problems in order to guide the selection and the use of cloud solutions.

Revenue structure – Customers associate cloud service delivery models with revenue generation. The interviews reveals that there is an awareness among customers that if cloud delivery models are properly use to drive innovation, it may help generating new revenue sources in addition to efficiency improvement through cost reduction.

Cost structure - The findings suggest that the magnitude of change in the cost structure is significant. The reduction of the capital expenditure higher than the reduction of operational expenditure. In the traditional model, customers are responsible for significant upfront capital investment for the deployment of large and complex enterprise resource planning systems as a well data centers. These investments move to the suppliers who become responsible for the development, operation and maintenance of the software and the infrastructure in the data centers. Part of the operational expenditure in the operation and maintenance activities also move to the suppliers.

The degree of interdependency between the variables of the business model innovation

To analyze the interdependency we measure the correlations between the sub-variables of business model innovation variables as defined Table 2. (1) Customer adoption is a sub-variable of the variable *emerging market*. (2) Innovation, (3) security, (4) cost reduction, (5) agility/flexibility and (6) time to market are sub-variables of the variable *value proposition*. (7) Redesign of the value chain is a sub-variable of the variable *value chain*. (8) New revenue source is a sub-variable of the variable *revenue structure*. (9) Reduction of OPEX and (10) Reduction of CAPEX are sub-variables of the variable *cost structure*. (11) Software as a Service, (12) Platform as a Service and (13) Infrastructure as a Service are the sub-variables of the variable *cloud service delivery model*.

The findings reveals a positive and significant correlation between innovation and customer adoption and between time to market and customer adoption. The correlation between cost reduction and customer adoption appears to be positive. But the correlation between security and customer adoption is negative. This is consistent with the concern of customers express regarding the perceived risk associated with security issues in cloud service delivery models. Surprisingly, the correlation between customer adoption and agility/flexibility is also negative. This is not consistent with the suggested benefit of cloud service delivery models as suggested in the interviews. Just two out of the three sub-variables of the value proposition correlate strongly and positively with the sub-variable of emerging market. This suggest a moderate interaction in general. This may suggest that while customer recognize the potential of cloud service models to help innovating their businesses, they are still cautious.

The correlation between the redesign of the value chain and customer adoption is positive and significant. It suggests a strong interaction and reinforcing relationship between the value chain variable and the emerging market variable. This is consistent with the findings from the interviews that suggest shifting boundaries in the value chain as a result of the adoption of cloud service delivery models. The correlation between new revenue sources and customer adoption appears to be positive

and significant. It suggests a strong interaction and reinforcing relationship between the revenue structure variable and the emerging market variable.

Table 3 Result of the Spearman's Rho correlations

Sub-variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1- Customer adoption	1												
2- Innovation	.482*	1											
3- Security	-.045	.350	1										
4- Cost reduction	.112	-.100	-.350	1									
5- Agility/Flexibility	-.308	.025	-.205	.204	1								
6- Time to market	.524*	.091	-.540*	.167	.247	1							
7- Redesign of the value chain	.518*	-.115	-.252	.585**	.152	.406	1						
8- New revenue source	.768**	.259	-.158	.079	-.413*	.374	.419*	1					
9- Reduction of OPEX	-.068	-.167	-.091	.247	-.207	-.078	-.266	.069	1				
10- Reduction of CAPEX	.519*	.203	-.203	-.118	-.030	.447	.240	.329	-.477	1			
11- Software as a Service	-.095	.209	.060	.060	.122	-.358	.027	.027	.251	-.410	1		
12- Platform as a Service	.493*	.575**	.325	.100	-.025	.247	.218	.338	-.278	.132	-.209	1	
13- Infrastructure as a Service	.594**	.100	-.325	.575**	-.204	.278	.516*	.529*	.350	.203	.209	.125	1

**p < 0.01 (two-tailed), *p < 0.05

The correlation between customer adoption and the reduction of OPEX (operational expenditure) is negative while the correlation between customer adoption and the reduction of CAPEX appears to be positive and significant. It suggests that the perceived benefit by customer is the reduction of their upfront investment in information technology solutions. Customer adoption correlates negatively with software as service. Customer adoption correlation positively and significantly with platform as a service and infrastructure as a service. Furthermore, platform as a service has a positive and significant correlation with innovation while infrastructure as a service has a positive and significant correlation with cost reduction, redesign of the value chain and new revenue source. The findings suggest that the sub-variables security, reduction of OPEX, agility/flexibility tend to be negative and not significantly correlated with other sub-variables. This may be caused by the limited data we dispose to assess the benefits generated through these sub-variables of the variables of the business model. However there are a number of positive and significant correlations between the sub-variables of the variables of the business model. It suggests the existence of reinforcing relationships in the interaction between the variables of the business model. These positive and significant correlations also suggest the positive effect of cloud delivery models on the innovation of the business model of customers.

Conclusion

Synthesis

This research emphasizes on how cloud service delivery models enable business model innovation. It is about understanding how organisations can create and capture value from technology innovation based cloud computing. In order to address this challenge, three research questions were defined to guide the investigation. The first research question focuses on identifying the cloud service model being adopted by customers. The findings shown that cloud technology is expected to become a key

technology with a strong competitive impact. However, customers are not pursuing a one size fits all approach. The adoption of a cloud service delivery model within organisations is constraints by specific challenges based on the nature of the activities within each organisation unit. It also appears that large organisation that are used to operate large complex enterprise resource planning systems tend to focus primarily on adopting infrastructure as service and platform as a service solutions. These large organisations are still dealing with the question of how to transition from large and complex enterprise resource planning systems to lightweight software as a service solution from the cloud.

The second research question aimed at determining the changes that occur on the existing business model of an organisation as a result of the adoption of cloud service delivery models. The content analysis of the data shown that the adoption of cloud service delivery models lead to substantial changes on all the variables of the business model. This means that the adoption cloud service delivery models leads to business model innovation according to definitions in the literature. However, it appears that the market for cloud service delivery models is in an emerging stage. Customers generally indicate that they are in the experimentation phase of using cloud delivery models due to the fact that cloud technology is not yet perceived as proven technology. Furthermore, because of the limited understanding of the impact of cloud service delivery model on their existing business model and the constraints by government regulation, customers in the government, the banking and the insurance sectors are more reluctant than in other sectors. In general the findings suggest that among customers there are frontrunners starting to adopt a cloud service delivery through. Another group of customers is choosing for a wait and see attitude until the cloud technology is widely perceived as proven technology. In this context we can assume that the innovation of business models of organisations using cloud service delivery models is still evolving. The statistical analysis presents a number of positive and significant correlations between sub-variables of the business model. This suggests the potential for creating and capturing value from cloud service delivery models. But the negative and not significant correlations suggest that there are still unknowns about the impact of the cloud service delivery models on the business model of organisations. Security issues and the magnitude of cost reduction on operational expenditure are examples of these unknowns at this stage. These unknowns suggest potential weaknesses in the current cloud delivery models.

Practical implications

When adopting cloud service delivery models, executives and senior managers within customer organisations should consider a learning and evolution approach in the pursuit of business model innovation as the market of cloud service delivery models is emerging. In this context the variables of the business model co-evolve with the maturity of the cloud technology and institutional changes such new regulations and new organisation boundaries and relationships that shape the new market environment. This suggests a perspective for a continuous refinement of the business model innovation over time. The co-evolution of the variables of the business model and the interactions between them over time might provide a realistic view of the value that be created and captured by customers and suppliers or business partners. This is consistent with the approach by Holloway and Sebastiao (2010) in their study of the role of business model in emerging market from an entrepreneurial action perspective. Such entrepreneurial action is opportunity driven and aims at benefiting from a learning experience to continuously refine the business model to market conditions of cloud service delivery models. Moreover, entrepreneurial actions could even help to shape the market conditions of cloud service delivery models.

This means that customers should not limit themselves to testing cloud technologies. In addition to technology assessment through technology projects, customers need to pay attention to the impact of cloud service delivery models on business model variables and the interdependencies between these variables in order to understand the effectiveness of the resulting business model innovation. .

Limitation and further research

This study has sought to contribute in research to the understanding of business model innovation in the context of a market that is emerging as a result of the introduction of a potential disruptive technology innovation. However, there are some limitations to the study. First, only one case study

was conducted with one large global manufacturer. Although the in-depth interviews from the case study provide interesting inside into how the adoption of a cloud service delivery model could help innovating the existing business model, it remains limited to be able to generalise the findings from the qualitative analysis. Second the number of participants to the survey is limited. This may explain why some correlations such as the correlation between the reduction of OPEX (Operational Expenditure) and customer adoption of cloud service delivery models appears to be negative. An extensive survey that will involve more organisations and participants may help collecting sufficient data in order to gain new insight. Further research will then focus on developing more case studies and an extensive survey that will involve more organisations. That will allow a replication of the framework and the opportunity to generalise the findings.

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